

**Notice of Allowability**

Application No.

10/501,748

Applicant(s)

YAKUMARU ET AL.

Examiner

Emily I. Nalven

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 6/18/07.
2. ☒ The allowed claim(s) is/are 1,2,6-8 and 18-23.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
  1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

## **DETAILED ACTION**

### **Reasons for Allowance**

1. The following is an examiner's statement of reasons for allowance: the prior art of Kuroda et. al. (US Patent No. 6,105,286) teach a refrigeration system that contains carbon dioxide, along with heat exchangers, compressors and decompressors. Masahiro et. al. (Japanese Patent No. 2002-081768) teach a refrigerant-to-water heat exchanger. Kuroda et. al. however, don't teach the limitation of having a refrigerant-to-water heat exchanger nor do they teach sequentially connecting the compressor, refrigerant-water heat exchanger, first decompressor, first heat exchanger, internal heat exchanger, second decompressor, and internal heat exchanger. Kuroda et. al. teach don't teach a decompressor between two heat exchangers directly after the compressor. Kuroda et. al. teach the decompressor between two heat exchangers after the refrigerant has gone through other elements in the cycle therefore it won't be as compressed as had it been if it came directly from the compressor. Additionally, Kuroda et. al. do not teach the limitation of a radiator separate from the heater core or a water cycle subsystem which is uniquely taught by the applicant.

Masahiro et. al. teach the refrigerant-water heat exchanger using carbon dioxide as a refrigerant and sequentially connecting the compressor, refrigerant-water heat exchanger, first decompressor and first heat exchanger but then teach cycling the

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refrigerant back to the compressor (see Fig. 1) and not the internal heat exchanger as claimed by the applicant.

While all of the elements such as refrigerant-water heat exchangers, compressors and decompressor are known to be used for refrigerating cycles it has not been shown to place them sequentially as described in claim 1 lines 24-28 by the applicant and shown in the applicant's drawings. Claim 1 is thus allowable because the prior art of record fails to teach the sequence of refrigeration elements as claimed in claim 1 lines 24-28 or suggest a motivation to placing elements in that particular sequence. Additionally, the prior art of record does not structurally suggest or show having a water and refrigerant cycle as claimed by the applicant.

2. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and to avoid processing delays should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emily I. Nalven whose telephone number is 571-272-3045. The examiner can normally be reached on Monday - Thursday 8 AM - 5:30 PM and on alternate Fridays 8 AM – 4:30 PM.

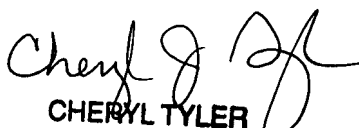
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisors, Cheryl J. Tyler can be reached on 571-272-4834 or Frantz Jules can be

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reached on 571-272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Emily Iris Nalven  
Art Unit 3744  
August 30, 2007

  
**CHERYL TYLER**  
**SUPERVISORY PATENT EXAMINER**